

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

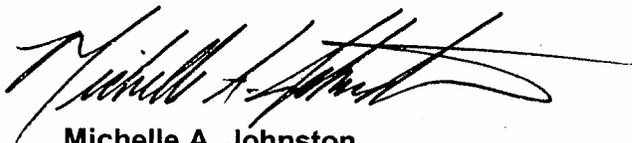
ANALYTICAL REPORT

Perfluorocarbon (PFC) Analysis

Lot #: D9K200620

Dena Haverland

Dalton Utilities
1200 V.D. Parrot Jr. Parkway
Dalton, GA 30721



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January 13, 2010

Case Narrative D9K200620

TestAmerica Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the methods summary page in accordance with the methods indicated. Dilution factors and footnotes are provided on each datasheet to assist in the interpretation of the results.

The results relate only to the samples in this report and meet all requirements of NELAC. All data have been reviewed for compliance with the laboratory QA/QC plan and have found to be compliant with laboratory protocols with any exceptions noted below.

Please note that Non-Detect (ND) results have been evaluated down to the Method Detection Limit (MDL) and should be considered ND at the MDL. Unless otherwise noted, results for solids have been dry weight corrected.

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Sample Arrival and Receipt

The following report contains the analytical results for eight samples received at TestAmerica Denver on November 20, 2009, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 12.1°C.

The samples were received above the recommended temperature of 4 +/- 2 degrees Celsius. The client was notified on November 23, 2009.

No other anomalies were encountered during sample receipt.

Standards

Analytical standards were prepared using commercially available certified solutions containing all compounds of interest.

The mass labeled compounds 13C4 PFBA, 13C2 PFHxA, 18O2 PFHxS, 13C4 PFOA, 13C4 PFOS, 13C5 PFNA, 13C2 PFDA, 13C2 PFUnA, 13C2 PFDoA, and D3 MeFOSA were introduced at the extraction step and were used for internal standards for the quantitation of the target compounds.

Sample Extraction and Analysis

The samples presented in this report were extracted for the target analytes by TestAmerica Denver's Standard Operating Procedure (SOP) DV-OP-0019 and analyzed for the target analytes by TestAmerica Denver's SOP DV-LC-0012.

Method QC Samples

The Method Blank is processed reagent water spiked with internal standard and prepared with each batch of 20 samples of the same matrix. The method blanks were non-detect at the reporting limits for the target analytes.

Each batch is prepared with low and mid level Laboratory Control Samples (LCS). The LCS recoveries for both levels were within established control limits, with the exception of the items noted in section Analytical Comments.

Lot #: D9K200620

Analytical Comments

The Standard Operating Procedure (SOP) was altered slightly in the sample preparation for FOSA. Sodium hydroxide was added to both samples to obtain a pH of 14 instead of the SOP required <2. The basic pH is generating better internal standard recoveries for MeFOSA.

The method required MS/MSD could not be performed for QC batch 9328466, due to insufficient sample volume. Method precision and accuracy have been verified by the acceptable low-level LCS and mid-level LCS/LCSD analyses data.

The Standard Operating Procedure (SOP) was altered slightly for these samples in the sample prep and LC conditions. The alterations are listed below.

Solvents are now the same as they were in the original SOP and run per the following gradient: From 0 to 11 minutes, the flow rate is 0.4 mL/minute and the MeOH ramps up from 25% to 100%. From 11 to 11.01 minutes, the flow rate increases to 0.7 mL/minute and this flow is diverted from the MS. At 13 minutes the flow rate decreases back down to 0.4 mL/minute and 25% MeOH. The column then equilibrates to 14 minutes.

PFTriA and PFTeA now use 13C2 PFUnA as their internal standard instead of 13C2 PFDoA.

No other anomalies were observed.

EXECUTIVE SUMMARY - Detection Highlights

D9K200620

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
11-18-09-01 11/18/09 11:06 001				
Perfluorooctanoic Acid	0.019 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.017 J	0.020	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.0063 J	0.020	ug/L	DEN -LC-0012
11-18-09-02 11/18/09 11:19 002				
Perfluorooctanoic Acid	0.057	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.017 J	0.020	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.012 J	0.030	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.016 J	0.020	ug/L	DEN -LC-0012
Perfluoroheptanoic acid (PFHpA)	0.017 J	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.0083 J	0.020	ug/L	DEN -LC-0012
Perfluorohexane sulfonate (PFH)	0.011 J	0.030	ug/L	DEN -LC-0012
11-18-09-03 11/18/09 11:53 003				
Perfluorooctanoic Acid	0.011 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.029	0.020	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.0050 J	0.020	ug/L	DEN -LC-0012
11-18-09-04 11/18/09 12:10 004				
Perfluorooctanoic Acid	0.13	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.027	0.020	ug/L	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	0.035	0.020	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.093	0.030	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.063	0.020	ug/L	DEN -LC-0012
Perfluoroheptanoic acid (PFHpA)	0.047	0.020	ug/L	DEN -LC-0012
Perfluorononanoic acid (PFNA)	0.019 J	0.020	ug/L	DEN -LC-0012
Perfluorodecanoic acid (PFDA)	0.030	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.030	0.020	ug/L	DEN -LC-0012
11-18-09-05 11/18/09 12:25 005				
Perfluorooctanesulfonate	0.025	0.020	ug/L	DEN -LC-0012
11-18-09-06 11/18/09 006				
Perfluorooctanesulfonate	0.025	0.020	ug/L	DEN -LC-0012

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9K200620

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
11-18-09-07 11/18/09 12:42 007				
Perfluorooctanoic Acid	0.012 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.031	0.020	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.0037 J	0.020	ug/L	DEN -LC-0012
11-18-09-08 11/18/09 13:04 008				
Perfluorooctanoic Acid	0.10	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.072	0.020	ug/L	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	0.013 J	0.020	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.039	0.030	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.049	0.020	ug/L	DEN -LC-0012
Perfluoroheptanoic acid (PFHpA)	0.038	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.030	0.020	ug/L	DEN -LC-0012
Perfluorohexane sulfonate (PFH)	0.041	0.030	ug/L	DEN -LC-0012

METHODS SUMMARY

D9K200620

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
LC/MS/MS PFCs	DEN -LC-0012	SW846 FOSA spec

References:

DEN Severn Trent Laboratores, Denver, Facility Standard
Operating Procedure.

METHOD / ANALYST SUMMARY

D9K200620

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
DEN -LC-0012	Andria Lenoble	000800
DEN -LC-0012	Jacqueline Bonnett	003601

References:

DEN Severn Trent Laboratores, Denver, Facility Standard
 Operating Procedure.

SAMPLE SUMMARY

D9K200620

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
LPW4F	001	11-18-09-01	11/18/09	11:06
LPW4W	002	11-18-09-02	11/18/09	11:19
LPW40	003	11-18-09-03	11/18/09	11:53
LPW41	004	11-18-09-04	11/18/09	12:10
LPW42	005	11-18-09-05	11/18/09	12:25
LPW44	006	11-18-09-06	11/18/09	
LPW46	007	11-18-09-07	11/18/09	12:42
LPW47	008	11-18-09-08	11/18/09	13:04

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Dalton Utilities

Client Sample ID: 11-18-09-01

HPLC

Lot-Sample #....: D9K200620-001 Work Order #....: LPW4F1AA Matrix.....: WATER
Date Sampled....: 11/18/09 11:06 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #....: 9327211 Analysis Time...: 02:18
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	0.019 J	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.017 J	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
13C4 PFOA	86	(60 - 155)
13C4 PFOS	60	(45 - 130)

NOTE(S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-01

HPLC

Lot-Sample #...: D9K200620-001 Work Order #...: LPW4F1AC Matrix.....: WATER
Date Sampled...: 11/18/09 11:06 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #...: 9328466 Analysis Time...: 12:45
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		
		<u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
MeFOSA	60	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-01

HPLC

Lot-Sample #...: D9K200620-001 Work Order #...: LPW4F2AA Matrix.....: WATER
 Date Sampled...: 11/18/09 11:06 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #...: 9327211 Analysis Time...: 05:57
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	0.0063 J	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
13C4 PFOA	95	(60 - 155)
13C4 PFOS	77	(45 - 130)
13C4 PFBA	101	(36 - 130)
13C2 PFHxA	94	(55 - 135)
18O2 PFHxS	97	(61 - 130)
13C5 PFNA	83	(54 - 132)
13C2 PFDA	70	(53 - 130)
13C2 PFUnA	52	(37 - 130)
13C2 PFDoA	47	(26 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-02

HPLC

Lot-Sample #...: D9K200620-002 Work Order #...: LPW4W1AA Matrix.....: WATER
Date Sampled...: 11/18/09 11:19 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #...: 9327211 Analysis Time...: 02:23
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	0.057	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.017 J	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	86	(60 - 155)
13C4 PFOS	57	(45 - 130)

NOTE (S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-02

HPLC

Lot-Sample #....: D9K200620-002 Work Order #....: LPW4W1AC Matrix.....: WATER
Date Sampled....: 11/18/09 11:19 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #....: 9328466 Analysis Time...: 12:50
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
MeFOA	50	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-02

HPLC

Lot-Sample #....: D9K200620-002 Work Order #....: LPW4W2AA Matrix.....: WATER
 Date Sampled....: 11/18/09 11:19 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #....: 9327211 Analysis Time...: 06:12
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	0.012 J	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	0.016 J	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	0.017 J	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
A)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
A)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
S)				
Perfluorobutane sulfonate (PFBS)	0.0083 J	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	0.011 J	0.030	ug/L	0.0070

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
13C4 PFOA	110	(60 - 155)
13C4 PFOS	84	(45 - 130)
13C4 PFBA	113	(36 - 130)
13C2 PFHxA	113	(55 - 135)
18O2 PFHxS	110	(61 - 130)
13C5 PFNA	93	(54 - 132)
13C2 PFDA	85	(53 - 130)
13C2 PFUnA	76	(37 - 130)
13C2 PFDoA	77	(26 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-03

HPLC

Lot-Sample #....: D9K200620-003 Work Order #....: LPW401AA Matrix.....: WATER
Date Sampled....: 11/18/09 11:53 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #....: 9327211 Analysis Time...: 02:28
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		
		<u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	0.011 J	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.029	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>
	<u>RECOVERY</u>	<u>LIMITS</u>
13C4 PFOA	91	(60 - 155)
13C4 PFOS	70	(45 - 130)

NOTE (S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-03

HPLC

Lot-Sample #....: D9K200620-003 Work Order #....: LPW401AC Matrix.....: WATER
Date Sampled....: 11/18/09 11:53 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #....: 9328466 Analysis Time...: 12:55
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
MeFOSA	47	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-03

HPLC

Lot-Sample #....: D9K200620-003 Work Order #....: LPW402AA Matrix.....: WATER
 Date Sampled....: 11/18/09 11:53 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #....: 9327211 Analysis Time...: 06:27
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	0.0050 J	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
A)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
A)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
13C4 PFOA	108	(60 - 155)
13C4 PFOS	92	(45 - 130)
13C4 PFBA	106	(36 - 130)
13C2 PFHxA	101	(55 - 135)
18O2 PFHxS	100	(61 - 130)
13C5 PFNA	95	(54 - 132)
13C2 PFDA	90	(53 - 130)
13C2 PFUnA	84	(37 - 130)
13C2 PFDoA	81	(26 - 130)

NOTE(S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-04

HPLC

Lot-Sample #....: D9K200620-004 Work Order #....: LPW411AA Matrix.....: WATER
Date Sampled....: 11/18/09 12:10 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #....: 9327211 Analysis Time...: 02:33
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	0.13	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.027	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>
	<u>RECOVERY</u>	<u>LIMITS</u>
13C4 PFOA	89	(60 - 155)
13C4 PFOS	64	(45 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-04

HPLC

Lot-Sample #....: D9K200620-004 Work Order #....: LPW411AC Matrix.....: WATER
Date Sampled....: 11/18/09 12:10 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #....: 9328466 Analysis Time...: 13:00
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
MeFOSA	46	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-04

HPLC

Lot-Sample #...: D9K200620-004 Work Order #...: LPW412AA Matrix.....: WATER
 Date Sampled...: 11/18/09 12:10 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #...: 9327211 Analysis Time...: 06:42
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	0.035	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	0.093	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	0.063	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	0.047	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	0.019 J	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	0.030	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
A)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
A)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	0.030	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	120	(60 - 155)
13C4 PFOS	95	(45 - 130)
13C4 PFBA	125	(36 - 130)
13C2 PFHxA	119	(55 - 135)
18O2 PFHxS	112	(61 - 130)
13C5 PFNA	101	(54 - 132)
13C2 PFDA	93	(53 - 130)
13C2 PFUnA	83	(37 - 130)
13C2 PFDoA	86	(26 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-05

HPLC

Lot-Sample #....: D9K200620-005 Work Order #....: LPW421AA Matrix.....: WATER
Date Sampled....: 11/18/09 12:25 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #....: 9327211 Analysis Time...: 02:38
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	ND	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.025	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	85	(60 - 155)
13C4 PFOS	47	(45 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-05

HPLC

Lot-Sample #....: D9K200620-005 Work Order #....: LPW421AC Matrix.....: WATER
Date Sampled....: 11/18/09 12:25 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #....: 9328466 Analysis Time...: 13:05
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
MeFOSA	46	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-05

HPLC

Lot-Sample #...: D9K200620-005 Work Order #...: LPW422AA Matrix.....: WATER
 Date Sampled...: 11/18/09 12:25 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #...: 9327211 Analysis Time...: 06:57
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	ND	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	117	(60 - 155)
13C4 PFOS	71	(45 - 130)
13C4 PFBA	119	(36 - 130)
13C2 PFHxA	122	(55 - 135)
18O2 PFHxS	112	(61 - 130)
13C5 PFNA	87	(54 - 132)
13C2 PFDA	66	(53 - 130)
13C2 PFUnA	57	(37 - 130)
13C2 PFDoA	53	(26 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-06

HPLC

Lot-Sample #....: D9K200620-006 Work Order #....: LPW441AA Matrix.....: WATER
Date Sampled....: 11/18/09 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #....: 9327211 Analysis Time...: 02:43
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	ND	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.025	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	85	(60 - 155)
13C4 PFOS	50	(45 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-06

HPLC

Lot-Sample #...: D9K200620-006 Work Order #...: LPW441AC Matrix.....: WATER
Date Sampled...: 11/18/09 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #...: 9328466 Analysis Time...: 13:10
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
MeFOSA	53	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-06

HPLC

Lot-Sample #....: D9K200620-006 Work Order #....: LPW442AA Matrix.....: WATER
 Date Sampled....: 11/18/09 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #....: 9327211 Analysis Time...: 07:12
 Dilution Factor: 1
 Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	ND	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTEA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
13C4 PFOA	119	(60 - 155)
13C4 PFOS	73	(45 - 130)
13C4 PFBA	114	(36 - 130)
13C2 PFHxA	112	(55 - 135)
18O2 PFHxS	103	(61 - 130)
13C5 PFNA	85	(54 - 132)
13C2 PFDA	69	(53 - 130)
13C2 PFUnA	62	(37 - 130)
13C2 PFDoA	57	(26 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-07

HPLC

Lot-Sample #...: D9K200620-007 Work Order #...: LPW461AA Matrix.....: WATER
Date Sampled...: 11/18/09 12:42 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #...: 9327211 Analysis Time...: 02:53
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		
		<u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	0.012 J	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.031	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>
	<u>RECOVERY</u>	<u>LIMITS</u>
13C4 PFOA	92	(60 - 155)
13C4 PFOS	51	(45 - 130)

NOTE(S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-07

HPLC

Lot-Sample #...: D9K200620-007 Work Order #...: LPW461AC Matrix.....: WATER
Date Sampled...: 11/18/09 12:42 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #...: 9328466 Analysis Time...: 13:15
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
MeFOSA	48	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-07

HPLC

Lot-Sample #...: D9K200620-007 Work Order #...: LPW462AA Matrix.....: WATER
 Date Sampled...: 11/18/09 12:42 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #...: 9327211 Analysis Time...: 07:27
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	0.0037 J	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	ND	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
A)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
A)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
Perfluorobutane sulfonate (PFBS)	ND	0.020	ug/L	0.0082
Perfluorohexane sulfonate (PFHxS)	ND	0.030	ug/L	0.0070

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	106	(60 - 155)
13C4 PFOS	67	(45 - 130)
13C4 PFBA	111	(36 - 130)
13C2 PFHxA	105	(55 - 135)
18O2 PFHxS	100	(61 - 130)
13C5 PFNA	83	(54 - 132)
13C2 PFDA	61	(53 - 130)
13C2 PFUnA	55	(37 - 130)
13C2 PFDoA	50	(26 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-18-09-08

HPLC

Lot-Sample #....: D9K200620-008 Work Order #....: LPW471AA Matrix.....: WATER
Date Sampled....: 11/18/09 13:04 Date Received...: 11/20/09
Prep Date.....: 11/23/09 Analysis Date...: 12/05/09
Prep Batch #....: 9327211 Analysis Time...: 02:58
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctanoic Acid	0.10	0.020	ug/L	0.0098
Perfluorooctanesulfonate	0.072	0.020	ug/L	0.013

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	90	(60 - 155)
13C4 PFOS	54	(45 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-08

HPLC

Lot-Sample #....: D9K200620-008 Work Order #....: LPW471AC Matrix.....: WATER
Date Sampled....: 11/18/09 13:04 Date Received...: 11/20/09
Prep Date.....: 11/24/09 Analysis Date...: 12/01/09
Prep Batch #....: 9328466 Analysis Time...: 13:20
Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
MeFOSA	51	(37 - 130)

Dalton Utilities

Client Sample ID: 11-18-09-08

HPLC

Lot-Sample #....: D9K200620-008 Work Order #....: LPW472AA Matrix.....: WATER
 Date Sampled....: 11/18/09 13:04 Date Received...: 11/20/09
 Prep Date.....: 11/23/09 Analysis Date...: 12/24/09
 Prep Batch #....: 9327211 Analysis Time...: 07:42
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	0.013 J	0.020	ug/L	0.0098
Perfluoropentanoic acid (PFPA)	0.039	0.030	ug/L	0.011
Perfluorohexanoic acid (PFHxA)	0.049	0.020	ug/L	0.0029
Perfluoroheptanoic acid (PFHpA)	0.038	0.020	ug/L	0.013
)				
Perfluorononanoic acid (PFNA)	ND	0.020	ug/L	0.017
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUnA)	ND	0.020	ug/L	0.0069
)				
Perfluorododecanoic acid (PFDoA)	ND	0.020	ug/L	0.015
)				
Perfluorotridecanoic acid (PFTriA)	ND	0.020	ug/L	0.018
)				
Perfluorotetradecanoic acid (PFTeA)	ND	0.020	ug/L	0.015
)				
Perfluorobutane sulfonate (PFBS)	0.030	0.020	ug/L	0.0082
)				
Perfluorohexane sulfonate (PFHxS)	0.041	0.030	ug/L	0.0070

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
13C4 PFOA	99	(60 - 155)
13C4 PFOS	66	(45 - 130)
13C4 PFBA	102	(36 - 130)
13C2 PFHxA	99	(55 - 135)
18O2 PFHxS	94	(61 - 130)
13C5 PFNA	81	(54 - 132)
13C2 PFDA	57	(53 - 130)
13C2 PFUnA	41	(37 - 130)
13C2 PFDoA	33	(26 - 130)

NOTE(S):

J Estimated result. Result is less than RL.